

In the claims:

Claims 1-22 (Cancelled)

23. (New) A composite comprising a metallic substrate and a predominantly amorphous and hermetic aluminophosphate film in which the film and the substrate are adhered through a phosphate-bonded metal oxide, an oxide layer linked to phosphate groups, or mixtures thereof.

24. (New) A composite of claim 23 in which the metal substrate contains iron, aluminum, magnesium, zinc, silver, copper, or alloys of steel, titanium, nickel, or copper.

25. (New) A composite of claim 23 in which the metal substrate is a steel alloy.

26. (New) A composite of claim 23 which has been cured at a temperature of at least 300 °C.

27. (New) A composite of claim 23 in which the predominantly amorphous aluminophosphate film contains [—PO₄—AlO₄—AlO₆—AlO₄—PO₄—] fragments.

28. (New) A composite of claim 23 in which the film contains carbon, metal, or metal compound nanoparticles.

29. (New) A composite of claim 28 in which the nanoparticles have dimensions of about 1 to about 500 nm.

30. (New) A composite of claim 23 in which the substrate is a steel alloy and the metal oxide an iron oxide or a chromium oxide.

31. (New) A composite of claim 23 wherein the film is about 0.05 micron to about 10 microns thick.

32. (New) A composite of claim 23 wherein said film is about 0.1 micron to about 1.0 micron thick.

33. (New) A composite of claim 23 further including an organic component on said film.

34. (New) A composite of claim 23 wherein said film is opaque to visible light.

35. (New) A composite of claim 23 wherein said film is transparent to visible light.

36. (New) A composite of claim 23 which is non-stick against molten metal.
37. (New) A composite of claim 23 having a surface energy of about 32 mJ/m².
38. (New) A composite comprising a metallic substrate and a predominantly amorphous and hermitic aluminophosphate film containing [—PO₄—AlO₄—AlO₆—AlO₄—PO₄—] fragments, wherein the film and the substrate are adhered through a phosphate-bonded metal oxide, an oxide layer linked to phosphate groups, or mixtures thereof.
39. (New) A composite of claim 38 in which the film contains carbon, metal, or metal compound nanoparticles.
40. (New) A composite of claim 38 in which the nanoparticles have dimensions of about 1 to about 500 nm.
41. (New) A composite of claim 38 has been cured at a temperature of at least 300 °C.
42. (New) A composite of claim 38 in which the metal substrate is a steel alloy.